

**We Claim:**

1. A nickel based bimetallic catalyst of the formula  $\text{Ni}(\text{x})\text{B}(\text{y})/\text{A}$  wherein A is a support selected from the group consisting of carbon, alumina, silica, carbonate and zeolite, B is selected from the group consisting of platinum and palladium and  $\text{x} = 0.5\text{-}99.9\%$ ;  $\text{y} = 0.2$  to  $10\%$ , expressed as % of A.
2. A process for the preparation of a nickel based bimetallic catalyst of the formula  $\text{Ni}(\text{x})\text{B}(\text{y})/\text{A}$  wherein A is a support selected from the group consisting of carbon, alumina, silica, carbonates and zeolite, B is selected from platinum and palladium and  $\text{x} = 0.5\text{-}99.9\%$ ;  $\text{y} = 0.2$  to  $10\%$ , expressed as % of A, which comprises precipitating a nickel precursor on the support by preparing a slurry of the support in distilled water, heating the slurry to a temperature of at least  $60^\circ\text{C}$  and aging at this temperature under constant stirring for at least two hours, adding a solution of a Ni precursor, under constant stirring to this hot slurry, aging the mixture, bringing the pH of the mixture to a range of 7 to 12 in order to obtain a precipitate, cooling the reaction mixture to room temperature and removing the solvent from the resulting slurry to obtain a solid cake, drying the cake to remove the moisture, calcining in an inert or static air atmosphere, further reducing the catalyst by molecular hydrogen to obtain the Ni catalyst, impregnating the said Ni catalyst by adding a palladium or platinum source, reducing by a reducing agent to obtain bimetallic Ni based catalyst.
3. A process as claimed in claim 2 wherein the nickel precursor and support slurry mixture is aged for at least 6 hours.
4. A process as claimed in claim 2 wherein the nickel precursor is a nickel salt selected from the group consisting of acetate, bromide, chloride and nitrate.
5. A process as claimed in claim 2 wherein the source of platinum is a platinum salt selected from the group consisting of chloride and acetate.
6. A process as claimed in claim 2 wherein the source of platinum is  $\text{H}_2\text{PtCl}_4$ .
7. A process as claimed in claim 2 wherein the support is selected from the group consisting of alumina, silica, zeolite, carbonates of magnesium, calcium and barium and carbon.
8. A process as claimed in claim 2 wherein the precipitation step is carried out in basic medium having pH in the range from 7 to 12.
9. A process as claimed in claim 8 wherein the pH during precipitation is 9.

10. A process as claimed in claim 2 wherein the precipitating by adding drop-wise a solution of sodium carbonate, potassium carbonate, sodium hydroxide, potassium hydroxide and ammonium carbonate.
11. A process as claimed in claim 2 wherein the alkali carbonate is added in a 10% solution.
12. A process as claimed in claim 2 wherein the calcination is carried out in a furnace at 500°C for at least 10 hours.
13. A process as claimed in claim 2 wherein the reduction of Ni or Co is carried out in presence of molecular hydrogen at a temperature in the range of 400-800°C, preferably 500-700 °C
14. A process as claimed in claim 2 wherein the reduction of Pt and Pd is carried out by using reducing agent selected from the group consisting of hydrazine hydrate, a hydrogen containing gas and formaldehyde.
15. A process as claimed in claim 2 wherein the hydrogenation of the Nickel catalyst is done in a silica quartz tube placed in a furnace maintained at 500°C at a H<sub>2</sub> flow rate of  $5 \times 10^{-5}$ , m<sup>3</sup>/min for 10 hours.
16. A process for hydrogenation of m-dinitro benzene to m-phenylene diamine using the said improved catalyst as mentioned above which comprises hydrogenating the solution of m-dinitro benzene in an organic solvent, under stirring conditions, at temperature ranging between 90-190°C, terminating the reaction, cooling the reaction mixture to room temperature and separating catalyst by conventional methods, isolating the product by distillation.
17. A process as claimed in claim 16 wherein the organic solvent used is selected from an alcohol, dioxane and an ether.
18. A process as claimed in claim 17 wherein the organic solvent used is selected from ethyl alcohol, methyl alcohol, 1-4 dioxane and ethyl ether.
19. A process as claimed in claim 16 wherein the concentration of dinitro benzene in reaction mixture using the bimetallic catalyst is in the range of 10-70%, more preferably between 15-50%.
20. A process as claimed in claim 16 wherein the hydrogenation process is carried out under hydrogen pressure of 5-100 bar, more preferably between 10 – 80 bar.
21. A process as claimed in claim 16 wherein the reaction temperatures is in the range of 20°-200°C, more preferably between 80° -190°C.

22. A process as claimed in claim 16 wherein the conversion achieved is almost 100% for dinitro benzene with 98-100% selectivity for phenylene diamines at milder process conditions.
23. A process as claimed in claim 16 wherein the catalyst is reused for 5 runs without losing its activity.

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